

# Tapping into Sweetness: Maple Syrup 101



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# What is Maple Syrup?

- Natural sweetener from the concentrate of maple tree sap
- 40:1 ratio
- Process is older than European Settlement
  - There are several different N. American stories about its origin



# Health Benefits

- Considered to have more antioxidants and minerals with less calorie load than honey

- Lowers cholesterol

- Better brain health

## Nutritional Value for Various Sweeteners

% of Recommended Daily Value (DV) Per ¼ cup (60 ml)

	Maple Syrup	Corn Syrup	Honey	Brown Sugar	White Sugar
Manganese	95	0	4	2	0
Riboflavin	37	1	2	0	1
Zinc	6	0	2	0	0
Magnesium	7	0	1	2	0
Calcium	5	0	0	4	0
Potassium	5	0	1	1	0
Calories	216	220	261	216	196

**SOURCE:** Canadian Nutrient File  
(Health Canada) and USDA Nutrient Database

# ID Maples

- Opposite buds and leaves (MAD Buck)
- Leaves are lobed (# of lobes depend on species)
  - Boxelder is an exception
- Fruit – double samara
  - Fruit can mature in the spring or fall depending on species



Sugar maple (*Acer saccharum*)



Red maple (*Acer rubrum*)



Boxelder (*Acer negundo*)



Silver maple (*Acer saccharinum*)



Black maple (*Acer nigrum*)



Striped maple (*Acer pennsylvanicum*)



# Sugar Maple (*Acer saccharum*)

- 5 lobes
- Rounded sinuses
- Lack of serration
- Gold – Orange – Red in fall
- Fruit develops in the fall
- Very pointed terminal buds (winter ID)



# Red Maple (*Acer rubrum*)

- 3 lobes
- Serrated margins
- V-shaped sinuses
- Yellow to red fall color (typically red)
- Fruit ripen in spring (redish in color)
- Blunt, rounded terminal buds (winter ID)





# Boxelder (*Acer negundo*)

- Compound leaves (3-5 leaflets)
- Coarsely, serrate margins
- Yellow Fall Color
- Looks similar to poison ivy
- Fruit matures in fall and persist throughout winter
- Twig is typically green or purplish covered with glaucous bloom, buds are white and hairy











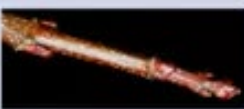









# Silver Maple (*Acer saccharinum*)

- Aka water maple
- 5 lobes, deep sinuses, margins are coarsely serrate
- Pale/silvery undersides to leaves
- Yellow fall color
- Flower VERY early
- Fruit mature in spring
- Twigs are similar to red maple, but stouter, unpleasant odor when crushed





# Maple Comparisons

Maple	Leaves	Fruit/Samara	Bud
Sugar Maple	 <ul style="list-style-type: none"> <li>• 5 lobes</li> <li>• Entire margins</li> <li>• Rounded sinuses</li> </ul>	 <ul style="list-style-type: none"> <li>• Horseshoe shaped</li> <li>• Ripen in fall</li> </ul>	 <ul style="list-style-type: none"> <li>• Brown, slender</li> <li>• Pointed</li> <li>• Lenticles</li> </ul>
Red Maple	 <ul style="list-style-type: none"> <li>• 3 lobes</li> <li>• Serrated margins</li> <li>• V-shaped, shallow sinuses</li> </ul>	 <ul style="list-style-type: none"> <li>• Wide V-shaped</li> <li>• Ripen spring/early summer</li> </ul>	 <ul style="list-style-type: none"> <li>• Red shiny</li> <li>• Blunt</li> <li>• Lenticles</li> </ul>
Silver Maple	 <ul style="list-style-type: none"> <li>• 5 lobes</li> <li>• Serrated margins</li> <li>• V-shaped, deep sinuses</li> </ul>	 <ul style="list-style-type: none"> <li>• V-shaped</li> <li>• Ripen spring</li> <li>• 2 1/2" or bigger</li> </ul>	 <ul style="list-style-type: none"> <li>• Like red maple but stouter</li> <li>• Red, shiny</li> <li>• Lenticles</li> </ul>
Boxelder	 <ul style="list-style-type: none"> <li>• Compound leaf</li> <li>• 3 to 5 leaflets</li> <li>• Serrated margins</li> </ul>	 <ul style="list-style-type: none"> <li>• V-shaped</li> <li>• Ripen in fall</li> </ul>	 <ul style="list-style-type: none"> <li>• Green to purple, stout</li> <li>• Fuzzy buds</li> </ul>
Black Maple	 <ul style="list-style-type: none"> <li>• 3 lobes</li> <li>• Entire margins</li> <li>• Shallow sinuses</li> <li>• Wilted look</li> </ul>	 <ul style="list-style-type: none"> <li>• Horseshoe shaped</li> <li>• Ripen in fall</li> </ul>	 <ul style="list-style-type: none"> <li>• Like sugar maple</li> <li>• Brown, slender</li> <li>• Pointed</li> <li>• Lenticles</li> </ul>
Striped Maple	 <ul style="list-style-type: none"> <li>• 3 lobes</li> <li>• Serrated margins</li> <li>• Goose-foot</li> </ul>	 <ul style="list-style-type: none"> <li>• Wide V-shaped</li> <li>• Ripen in late summer/early fall</li> </ul>	 <ul style="list-style-type: none"> <li>• Reddish/brown</li> <li>• Red bud scales</li> <li>• Bud scales valvate</li> </ul>

# Equipment and Tools - Tapping

- Taps/spiles (7/16", 5/16", 3/16")
- Cordless drill w/ correct drill bit
- Collection container
- Hammer/mallet
- Tubing
- Double hand cut-in pliers (\$200-\$300)
- Single hand pliers
- Tubing cutter





# Equipment/Tools





## Equipment/Tools



Amazon.com



Wikimedia.org



Amazon.com



Ebay.com



Etsy.com



Walmart.com



Etsy.com



# Equipment/Tools





# Picking your Tree

- Sugar/Red/Silver – 2-3%, 1-2%, 1-1.5%
- 10" DBH (diameter @ breast height)
  - 18"-24" – 2 taps
  - 24"+ – 3 taps
- The better the crown the better the sap
- Location feasibility





# Tapping

- Depth of sap hole – 1.5"-2" at a slight upward angle 5-10% slope
- Best if nothing is placed in hole to clean out shavings
- Tap gently until pitch changes



Thisinspired.life







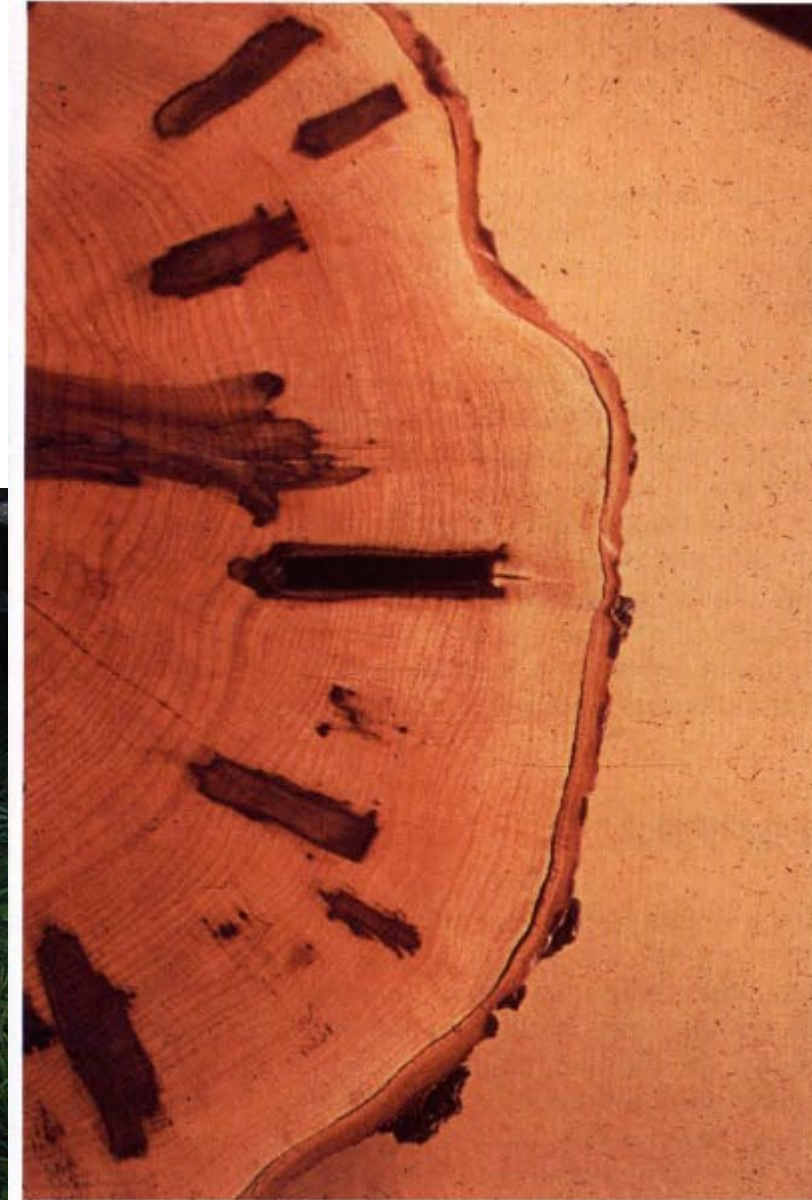
# When to tap

- Traditionally Valentine's Day was the marker
- Truly – it depends
- Freezing nights and above freezing during the day



# Tapping Tips

- Drill tapholes when temperatures are above freezing
- New tapholes
- Color of shavings
- Use a clean bit





# Tubing Systems





# Equipment and Tools - Tapping

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# Gravity Tubing

- 4 tap per 150' of 3/16" line
- To achieve natural vacuum, three things are necessary:
  - 1) a continuous leak-free line
  - 2) a drop in elevation from the tree to the bottom of the line
  - 3) enough sap in the line to create a gravitational pull (suction) on the taphole.



# Equipment and Tools – Collection & Cooking

- Transportation and/or storage container for sap
- Evaporation pan
- Heat source & fuel – gas, wood, oil
- Filters – big debris and finishing
- Hydrometer/Candy thermometer
- Finishing pot
- Syrup containers



# Sap Collection

- Sap must stay cool, it does spoil
- Sap needs to stay at 40 or below
- If sap gets cloudy/smells - spoiled



# Equipment/Tools - Cooking



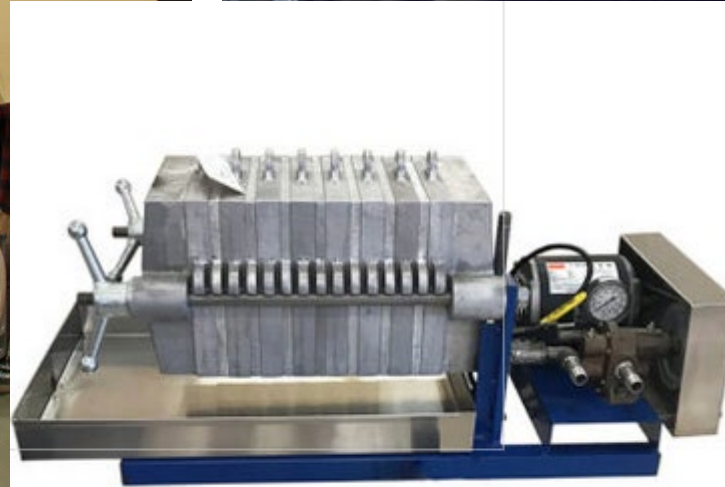
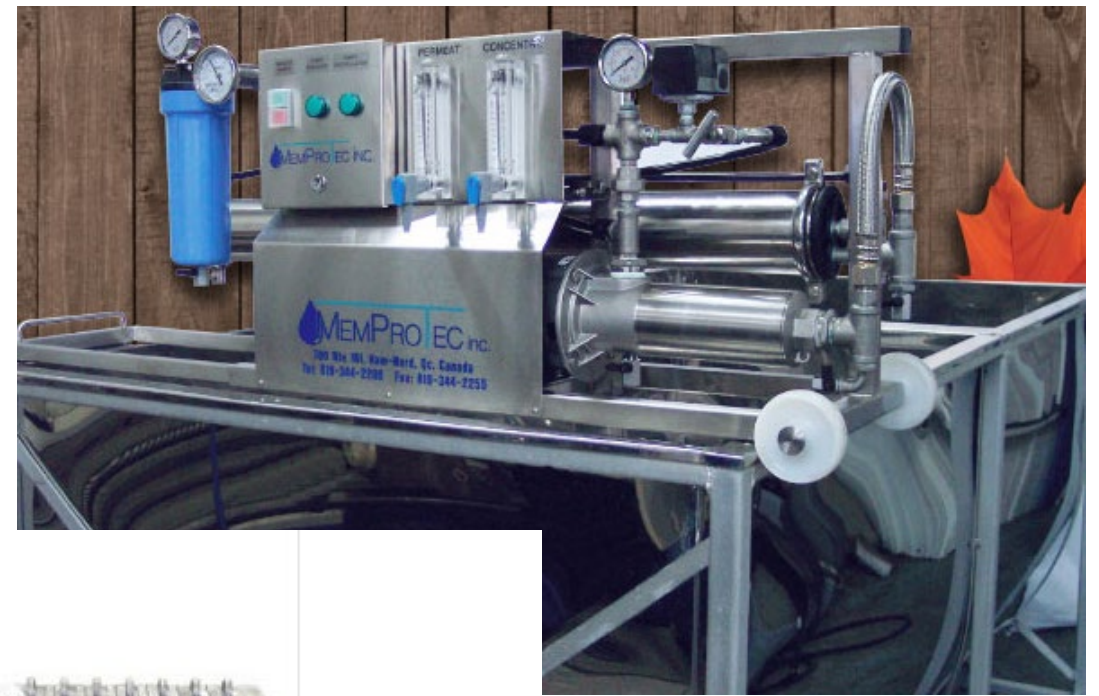


# Equipment/Tools





# Large Scale



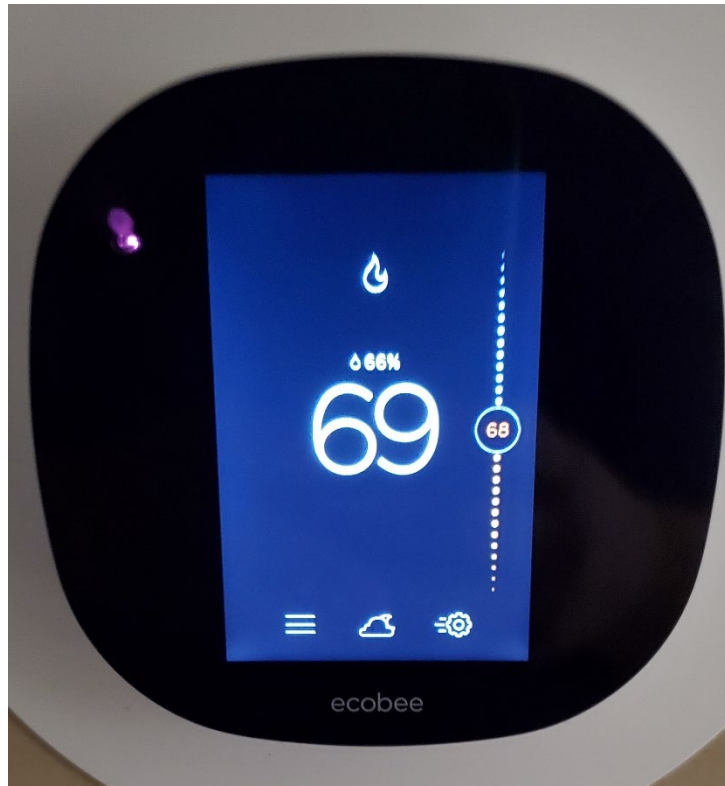


# Cooking it down

- Use the heat source best for you – propane/gas, wood, oil, pellets, etc.
- Enjoy the outdoors!
- Use a coarse filter (cheese cloth) to filter sap before boiling
- Evaporator pans – More surface area the better!
- Test the boiling point of water then add 7°F for finishing Temp. of syrup



# Cooking it down





# Cooking it down

- ~3" high when starting boil, add sap as needed
  - No need to stir sap
- Often a white foam will form on top
  - Skim Off or use a de-foamer
- Give yourself plenty of time!
  - Depending on the efficiency of your system, you may only be able to boil 1 gallon of sap per hour!
- As you get down below 1" of liquid, start considering smaller finishing pans
  - This avoids the risk of scorching
  - Gives you more overall control of temperature and in general



# When is sap syrup?

- Tree sap is usually around 2-3 Brix (2-3% sugar)
- Syrup must be between 66-68.9 Brix (66-68.9% sugar)
- This brix measurement can be accurately measured by a syrup hydrometer
  - Refractometer is also an option
- Other Signs:
  - Sheeting/Apron test
  - Temp 219 or 7°F
  - Foamy bubbles





# Equipment/Tools







# Cooking it down

- Filters are important
- Niter/Sugar sand
  - Do not clean with bleach or detergents (boil in clean water)
- After you pour in jar, turn the jar upside down and on its side to sterilize the jar
- 180°F-185° when filtered to be canned
  - Otherwise you will see niter/sugar sand on the bottom



# Storing

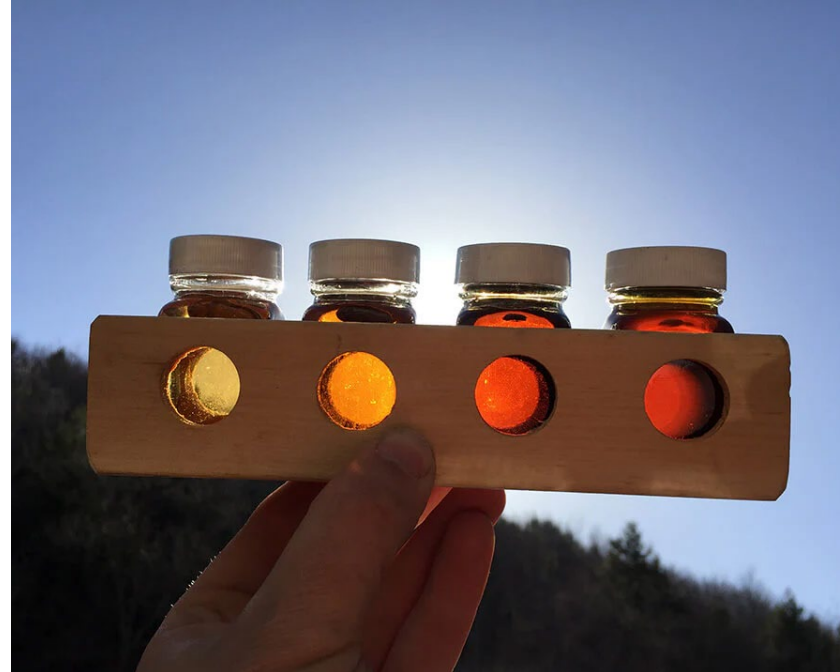
- Containers
  - Glass jars (mason jars)
  - Plastic food grade containers
  - Metal containers
- Once hot packed, let cool before stacking (2 years in dark storage)
- Freeze indefinitely
- Refrigerate after opening – 1 year





# Colors and Grades

- 2 grades: A & Processing
- Grade A has 4 distinct colors of Syrup: Golden, Amber, Dark, Very Dark



# Cleaning up

- The season is over when the weather & trees determines it is over
  - usually mid-March
  - stops going below freezing at night
  - buds are swelling and breaking open
  - sap turns yellow and cloudy
  - sap will have an off-flavor “buddy flavor”



# Cleaning up

- Remove spiles
  - pliers or hammer
- Clean equipment before storing
  - 1 part unscented household chlorine bleach to 20 parts water then triple rinse
  - Boil clean water
- Clean – Sanitize – Rinse (triple)
- No scented detergents/soaps/etc



# Resources

- <https://www.facebook.com/KYMapleSyrupAssociation/>
  - Non-Profit Organization
  - Connect with other KY syrup producers, learn, get advice, get help
  - Be part of a community
- <https://ky-maplesyrup.ca.uky.edu/>
  - Publications
  - Videos
  - Additional resources
- <https://agmr.osu.edu/sites/agmr/files/imce/pdfs/maplesyrup/KeepingLeadOutofMapleSyrup.pdf>
  - Lead information
- Mapletreader.com
  - Excellent community of maple tappers for advice, questions or purchase used equipment



# Beginners checklist

- Getting started
  - Rinse equipment with potable water
    - Drill/drill bit
    - Spile
    - Collection container
    - Hammer/mallet
    - Evaporator pan
    - Arch/fuel source
    - Candy thermometer/syrup hydrometer/both
    - Filters for large debris and finishing
    - Finishing pan
    - Syrup storage container
    - Clean-up option of choice